MT-76C TEST SET

DESCRIPTION AND MAINTENANCE

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FIG. 1

MT-76C TEST SET

DESCRIPTION AND MAINTENANCE

1. GENERAL

1.01 This section covers the description and maintenance of the MT-76C test set used in exchange and toll cables for conductor identification, exploring coil tests, and Wheatstone bridge measurements.

1.02 The MT-76C test set has a tone output of such character and magnitude that it may be used in exchange cables, voice frequency toll cables, and J or K carrier cables.

1.03 The MT-76C test sets are equipped with a Listen-Signal-Send key to facilitate listening on working lines in exchange cables in order to avoid any service interruptions. When the key is in the signaling position, both splicer and helper hear tone of about the same intensity as will be heard when the helper locates the pair under test.

1.04 The MT-76C is a solid state version of WECO 76C Test Set. Also, the WECO 76A, B or C, Test Set may be updated to the solid state MT-76C.

2. DESCRIPTION

2.01 The MT-76C test set has a solid-state oscillator producing a tone having a frequency of about 500 Hz with a 7 Hz warble. The resulting tone is easily recognized over noise in cables and is not tiring to listen to in making large cable transfers.

2.02 The MT-76C test set is housed in a stamped sheet metal box with a removable hinged cover. It is furnished with two 6-foot transfer cords with insulation piercing clips at one end and battery clips on the other end.

2.03 The MT-76C test sets are equipped with 3 solid state modules and printed circuit board for oscillator and relay functions.

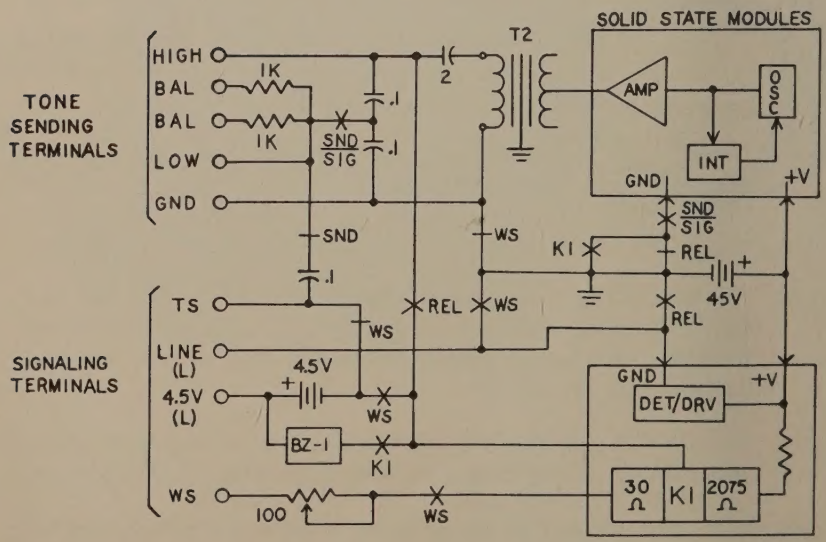
2.04 The positions and markings of the keys and binding posts on the MT-76C test set are shown in Figure 1.

2.05 Figure 2 is a schematic circuit diagram of the MT-76C test set.

2.06 The set has both LOW and HIGH tone outputs. The LOW tone is used for identifying exchange cable pairs, in which case operation of the tone is applied from one conductor to ground. The HIGH tone is used in identifying conductors in toll or exchange cable when tone is applied between two wires of a pair or quad.

2.07 The HIGH tone is also used in exchange cables for fault location by means of exploring coil tests. The current output of the set is much lower than that of the 20C Test Set which has been used in exploring coil tests heretofore and consequently a 4B, a 107A Amplifier, or a 91A Test Set is required with the 19C, 75A, or 75B Test Sets (exploring coils) to permit hearing the tone. Low tone from the MT-76C test set should be used whenever practical in fault locating work in order to avoid interference with working lines.

MT-76C DIAGRAM



KEY SWITCHES IN "LIS","TLK" AS SHOWN FIG. 2

3. MAINTENANCE

3.01 The MT-76C test set is of sturdy construction and should require relatively little maintenance aside from battery replacements and an occasional check to ensure that the control relay is operating satisfactorily.

3.02 *Operating Tests:* Since the 500 Hz tone delivered by the MT-76C test set is produced by a solid state oscillator there is no sound audible when the set is in operation. However, the operation of the tone generator can be checked by connecting a talking set to the binding posts marked LOW and GND, the keys being set at LIS and TLK. Then turn the tone on and off by moving the tone key slowly from LIS to SND several times. Warble tone should be heard each time the key is at SND.

3.03 If the operation of the tone seems to be erratic, it indicates that the batteries are low or that one of the solid state modules is defective. If no tone is heard, either the batteries are low or connected incorrectly.

3.04 If steady tone is heard instead of a warble tone, it is likely that the interrupter module is missing or defective.

3.05 *Batteries:* The set makes use of one 4½ volt, No. 714 Battery, and two 22½ volt, No. 763 Batteries. For ordinary identification operations, the batteries should be discarded when their voltages (measured while the set is in operation) are found to be below the following values: No. 714 Battery, 3.5 volts; No. 763 Battery, 19 volts. However, when the set is used in locating faults with the exploring coil, the battery voltages should not be allowed to fall below 4 volts and 20 volts, respectively. The life of the batteries with intermittent use of the set as a source of tone is about 100 hours of operation, but when the relay or buzzer is being used, the life of the batteries is somewhat shorter.

3.06 *Solid State Modules:* There are 3 modules located on the chassis of the MT-76C and are comprised of the interrupter module, the amplifier module, and the detector module. Also; on the main P.C.B. are the oscillator with transistor Q1, oscillator transformer, output transformer, and relay K1.

3.07 The MT-76C test set is electronically the same as the WECO 76A, 76B and 76C Sets and also mechanically, except for the solid state modules. (The 76B Set is similar to the 76A Set except for the type of key employed.)

3.08 The amplifier provides a current gain for the oscillator to drive the output transformer. If no tone output exists, the amplifier module may be defective.

3.09 The interrupter module provides an on-off control to the oscillator for the 7 Hz warble. If tone exists at the output without warble the interrupter module may be defective. Also, a defective interrupter may cause tone output to stop completely. The circuit is arranged so that removal of the interrupter module, if suspected defective, will provide continuous tone output.

3.10 The detector module is used in the relay functions only. If trouble is suspected in relay functions replacement of this module should clear trouble. Other causes of relay malfunctions are discussed in Paragraph 3.11.

3.11 The large P.C.B. contains relay K1 used in conjunction with the detector module and I.C.1. If trouble is not cleared by replacement of the detector module, relay K1 should be replaced. If trouble is still not cleared, see Paragraph 3.12.

3.12 *Relay Test:* The MT-76C test set employs a solid state detector module and relay. The proper functioning of this relay can be ascertained as follows:

(1) Check the batteries and, if necessary, replace those that have subnormal potential.

(2) Set the keys at LIS and TLK.

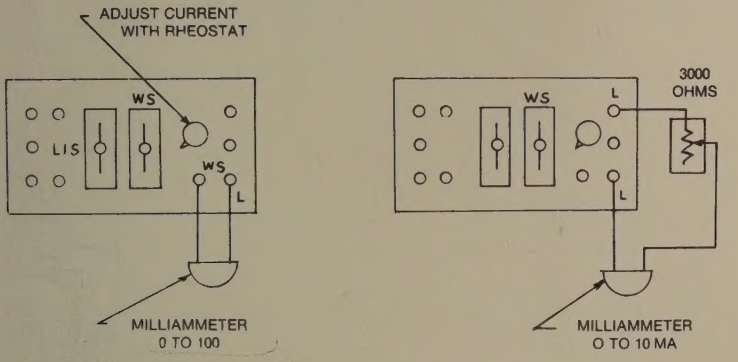
(3) Connect one wire across the BAL and L post and connect another wire across the other BAL and L post.

(4) Then slowly move the TLK key from TLK to WS-WAIT position several times. The buzzer in the set should operate steadily each time the key is in the WS-WAIT position.

(5) If the buzzer does not operate each time, or if the operation is slow or erratic, the batteries should be checked.

(6) If the batteries are satisfactory it indicates faulty relay operation. In this event the set should be returned for adjustment in accordance with local routine.

3.13 If it is impracticable to defer operations until a new set is available, the relay can be adjusted to operate at the current values indicated below, using the test circuits shown in Fig. 3.



PRIMARY WINDING TEST

OPERATE	100MA
NON-OPERATE	85MA

SECONDARY AND PRIMARY IN SERIES

OPERATE	7.5MA

FIG. 3

(1) In testing the operation with the primary winding of the relay, connect a 0-100 milliammeter where shown and set keys at LIS and WS-WAIT.

(2) Adjust the front panel rheostat shown in Fig. 3 in the set to 100 milliamperes; move the key from TLK to WS-WAIT several times. The relay should close and operate the buzzer when the key is in the WS position.

(3) Repeat the test with current set at 85 milliamperes through the relay. In the latter test the buzzer should not operate.

(4) Then check the operation with the primary and secondary windings in series. An external rheostat of 2500 to 3000 ohms is needed to limit the current flow, and a milliammeter capable of reading 0 to 10 mils.

(5) Set the current at 7½ mils and operate the keys as in the previous test. The buzzer should operate on each movement of the key to the WS-WAIT position.

(6) If tests in Paragraph 2 through 5 do not conform, replace detector module.

(7) If tests still do not conform with new detector module, adjust R1 potentiometer for paragraph 3.13(2). R1 is located inside the set on the OSC. P.C.B.

(8) No further tests are to be made and if trouble persists, unit should be sent to METRO TEL CORP. for repair.